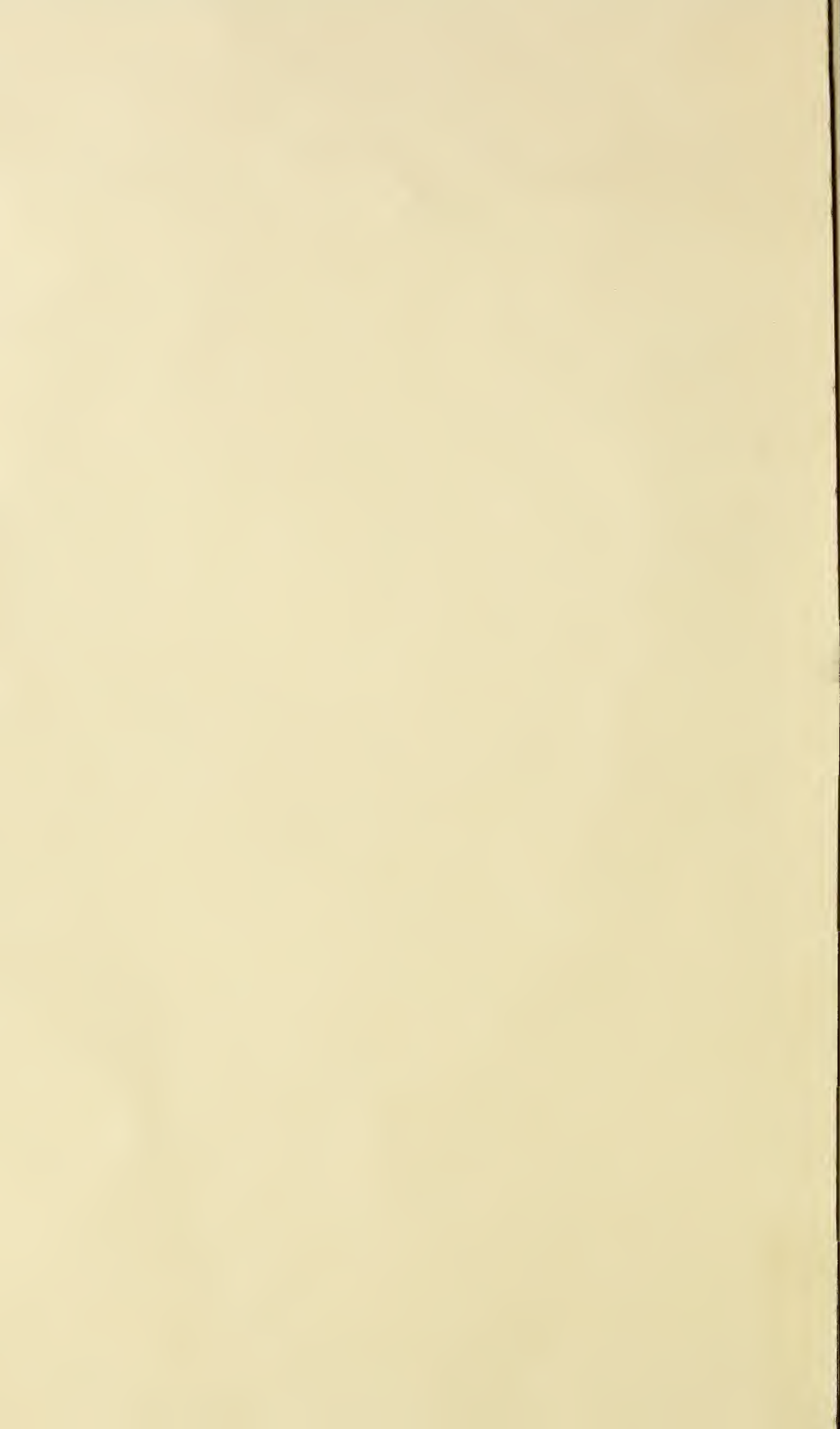


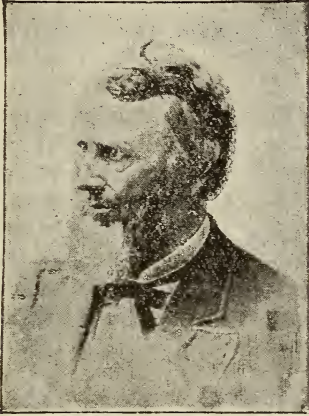
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brains, energy and character that counts at O. S. U., and though by force of circumstances some must labor, they are in no respect handicapped by it.

Dr. Norton S. Townshend.



The STUDENT has to record the death of the most distinguished figure connected with agricultural education in this country. After a brief illness Dr. Norton S. Townshend died Saturday, July 13, 1895, surrounded by all the members of his family. He was in his eightieth year and had been connected with the Ohio State University from its inception until his death. His wife, son and three daughters survive him.

A sketch of his life was published in the STUDENT December, 1894, and biographical sketches will appear elsewhere. Memorial resolutions were passed by numerous societies and institutions. The American Association of Agricultural Colleges and Experiment Stations passed resolutions of glowing tribute to the venerable man who had just passed away. Dr. Townshend, who led a very full and active life, stood as a great beacon light in education and the betterment of humanity.

Department of Agriculture.

This has been a prosperous year for the School of Agriculture and, hence, perhaps, a review of the year's work may be of interest to the readers of the STUDENT.

Foremost in the events worthy of mention is the number of students. This year there were 90, compared with 71, 47, 40 and 30, counting backward during four years. This year the students were distributed as follows: In the four-years' course of Agriculture and of Horticulture & Forestry, 36; in the two year course in Agriculture, 41; in the special winter course in Dairying, 13. There were, in addition, 16 students in the course in Veterinary Medicine.

It will not be the purpose of this article to describe in detail the courses of study, or the facilities of instruction. Full information with regard to such matters can be obtained from catalogues and circulars, which may be obtained free of charge by addressing the University authorities. The department of Agriculture will be here especially referred to, as distinguished from the departments of Horticulture, Veterinary Medicine, Agricultural Chemistry, Botany and Entomology, although each of these departments, as well as other departments of the University, form an integral part of the School of Agriculture.

The legislature having failed to pass the bill for a dairy school building at the University, the Board of Trustees placed at the disposal of the department of Agriculture, twenty-five hundred dollars for instruction in butter and cheese making. It was not possible, of course, with this sum to build and equip a building. Three rooms in the basement of the Chemical building, having a floor space 37x70 feet, were fitted up at an expense of about eighteen hundred dollars for apparatus and its installation. The equipment consisted in part of two power and four hand separators,

three power and four hand churns, three power butter workers and three hand workers, four receiving vats, three cream vats, one cheese vat, one three-hoop cheese press, one curd mill, six Babcock milk testers, six pairs of scales, refrigerator, forty lockers and the necessary cans, sinks, piping and smaller apparatus.

Some persons were disposed, at first to think lightly of the use of these basement rooms for this purpose. When, however, the apparatus was in place, the walls whitened and the woodwork nicely painted, the young men in their, clean white duck suits made a very attractive appearance, and the whole arrangement was favorably commented upon by the many visitors who came to see the sight.

One young man who secured a position in a creamery, at a good salary, through having taken the special course in Dairying last winter, wrote recently :

" My short course at the University has been of great value to me, and I can not praise it too highly. Am having good success with my creamery work, thanks to the instructions I received with you. This has been a very hard season in our line, owing to the drouth and prevailing low prices, but have sold our butter at or above Elgin prices all summer."

Forty-three students took laboratory work in butter making. Thirty were students in the regular Agricultural courses, while thirteen were enrolled as special dairy students. Owing to delay in installing apparatus, cheese making was not taught. This winter, however, cheese making will be, also, made prominent, and other features will be added, such as pasteurizing, milk.

The students are not merely taught manual dexterity in the performance of these operations, although this is insisted upon, but by carefully devised schedules they are taught to understand and appreciate the rela-

tions of the several operations to one another, and to know when the most satisfactory and economical results have been obtained.

The dairy laboratory was in charge of Professor DeWitt Goodrich, to whose wide experience and painstaking labors great credit is due. He was ably assisted by Mr. Oscar Bailey.

What is confidently predicted to become an important feature of a thorough training in Agriculture, was started in a quiet way during the year. This is an experimental study of soils by each student. Appropriate rooms were fitted up with suitable apparatus and fifteen students spent two hours each week in performing experiments with soil, to show the effect of cultivation, fertilization and drainage upon soils, and the differences in the physical properties of different soils.

An interesting thesis on the Physical Properties of some Ohio Soils, was prepared in this laboratory by C. W. Burkett and E. J. Riggs, of the recent graduating class. A thesis on the effect of food on the quality of milk, involving several seasons' work with the dairy herd, was completed by R. W. Dunlap, of the same class.

The study of animal mechanism and the judging of live-stock has been more fully developed than heretofore. Instruments of precision for measuring animals have been made or purchased, and by means of appropriate schedules and score cards the student is taught the significance of variations in form and to become a competent judge of animals. The live-stock of the University farm offers opportunity for this work, but the department is under many obligations to neighboring importers and breeders, for courtesies extended. A fine collection of lantern slides of typical animals of various breeds of live-stock add much to the value of the other instructions given.

The farm being conducted entire

upon its own resources, is not able to do any extensive experimental work. So far as the means of the farm will permit, such experiments are conducted as will be of the most instructional value to students and are performed by them. During the past year, experiments have been conducted in milk production, in pig feeding, and in egg production. Additional experiments have also been completed in corn culture.

The fertilizer and rotation experiments, which have attracted such wide attention, are continued by the department for the Ohio Agricultural Experiment Station, Wooster, Ohio.

One of the features of the University Farm, is the fact that not only the work of the farm is done by students almost exclusively, but the conduct of the farm is in a measure in the hands of agricultural students.

For this purpose, the farm is divided into five divisions, dairy, horses, swine, poultry and tools. There is a student chief of each division, who is responsible to the foreman of the farm, for the work of his division and the conduct of the students who are employed in his division. The loyalty of the students to the success of this enterprise has been gratifying. The department paid between four and five thousand dollars to students for labor, and gave upward of one hundred students labor at different times during the year. Students were also given employment in the Department of Horticulture upon the campus and in other departments of the University.

On April 1, 1895, Mr. F. P. Stump resigned the foremanship of the farm and moved upon his farm in Van Wert county. He was succeeded by Mr. W. D. Gibbs, who had taken an undergraduate and post-graduate course in the School of Agriculture of the University of Illinois. Mr. Gibbs resigned June 1st to accept a position in the office of the Division of Agri-

cultural Soils, Washington, D. C., and was succeeded by Mr. C. W. Burkett, who graduated in the School of Agriculture at our recent commencement. Subsequently Mr. W. D. Gibbs was elected assistant professor of Agriculture. It will thus be seen that two important additions have been made to the teaching force of the department during the year, assistant professor of dairying and assistant professor of agriculture, and the work of the department has been greatly strengthened thereby.

Our President.



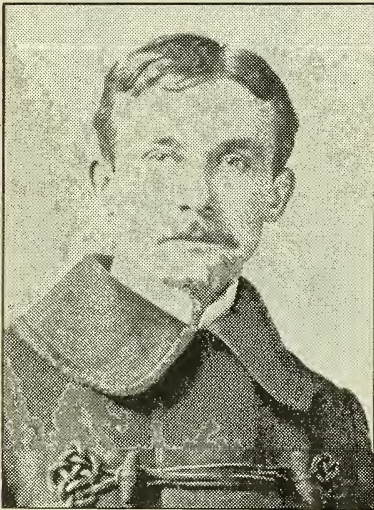
President James H. Canfield is an Ohio man, born in Delaware in 1847, and reared on a Vermont farm. Graduated from Williams College in 1863; engaged in railroading from '68 to '71, and during this time studied law; admitted to practice law in Jackson, Mich.; practiced for five years; was Professor of History, Political Science and Civics from '77 until '91, when he was called to the Chancellorship of the University of Nebraska. For four years he was Secretary of the National Educational Association, and in 1890 was its President. He is now an active member of numerous educational and civic associations. When he became Chancellor of the University of

Nebraska it had but five hundred students and a small faculty. At present the University has more than fifteen hundred students, a faculty of more than one hundred members, and the University is well and favorably known in educational circles.

President Canfield's term began July 1. To any who are seriously contemplating entering a progressive University, we extend to them a hearty welcome to enter with our new President this college year.

LIEUT. JOHN T. MARTIN,

New Professor of Military Science
and Tactics,



Was born in Columbus, O., Dec. 20th, 1865. Attended school until 15 years of age. Left the High School in 1881 to work in Huntington's Bank, where he remained until June 11th, 1885. On June 12 he reported at West Point, having been appointed from the 13th Congressional district by Hon. Jos. H. Outhwaite. During his attendance at West Point he was corporal, sergeant and captain of company, "C" and "B." Was graduated June 12th, 1889, with rank of 8th in a class of 47. Since graduation

he spent one summer with his mother, three years at Ft. Adams, Newport, when he was transferred to the artillery school at Ft. Monroe, Va., for special instruction. In March, 1895, he was appointed Professor of Military Science and Tactics at the Ohio State University. Lieut. Martin stands first in the list of 2d Lieutenants.

The Association of Agricultural Colleges and Experiment Stations.

The annual meeting of the Association of Agricultural Colleges and Experiment Stations convened in Denver on July 17th with about one hundred persons present. The majority of the eastern states and all states west of the Mississippi river, except South Dakota, were represented. The meeting lasted three days and there were three sessions each day of more than three hours each. There were numerous sectional meetings. It would not be possible within the limits of this article to even mention the titles of the subjects discussed.

It was an earnest, thoughtful body of men who were evidently impressed with the gravity of interests they represented. Those who have been in the habit of attending the meetings of this association pronounced it the most interesting and profitable meeting that the association had held. In the language of President Alvord, the object of the association is to raise the standard of work and promote the common and public good.

Heretofore administrative problems and the work of the experiment station has received chief attention. This year the subject of Agricultural and Mechanical instruction in its various phases received the largest share of attention. Standing committees have been appointed to report upon requirements for admission, the kind and length of courses, the subjects to be taught and for the purpose of systematizing the instruction in Agriculture with a view of bringing it into peda-

gogic form. The extent of Experiment Station enterprise was shown by the report of the executive committee, which stated that in 1893 there were issued from thirty-five stations 249 bulletins and reports containing 75,537,270 pages. There were handled at the postoffices from where they were mailed 1,741,495 separate pieces, weighing 276,495 pounds.

The proper demarkation between the station and college received very earnest consideration on the part of the convention.

By vote of the convention one session of the meeting was set aside to discuss the subject of irrigation. This very interesting discussion served to impress the delegates again with the great difference in the problems before the western states as compared with the eastern. It is calculated to make one think to realize that over one-half the area of the United States successful agriculture is largely dependent upon irrigation.

The adjournment of the convention was followed by an excursion to the Colorado Agricultural and Mechanical College, which is presided over by Dr. Alston Ellis, formerly a trustee of the Ohio State University. Fort Collins is situated in the valley of the Cache-la-Poudre in the northern part of the state. To reach Fort Collins the party was taken by the Gulf line through the heart of the agricultural section of Colorado, crossing the valleys of Clear Creek, the Boulder, the St. Vrain and the Thompson. For many this was the opportunity of a life-time to see what irrigation can do for the arid region. A five hours' stay was made at Fort Collins and the delegates were handsomely entertained by the faculty of the institution. The institution has a fine equipment. It is well housed, and has a beautiful setting with its irrigated farm, gardens and campus. Along with its other buildings it has a separate college building for agriculture, horticulture and irri-

gation engineering. It is prepared to do most excellent work and seems to be doing it.

One of the notable features of the convention was the attention it attracted. The papers of Denver printed from three to five columns of matter daily concerning the convention. The editorials were complimentary, intelligent and serious-minded.

Ohio was represented by Mr. L. B. Wing, of the Board of Trustees, and Professor S. W. Robinson, of the Mechanical Engineering department. Professors Detmers, Lazenby and Hunt were also in attendance. Prof. Lazenby was secretary of the section on Horticulture and Botany and presented several papers, one before the general session being on "How to teach Horticulture." Professor Hunt presented a paper in general session upon "Methods of Instruction in Agriculture." Their papers and those by others on the same subject created much earnest discussion.

Professor Robinson was elected vice-president of the association, and Professors Lazenby and Hunt were appointed on standing committees.

F. W. Rane, of the class of 1891 at the Ohio State University, and professor of Agriculture and Horticulture of the University of West Virginia, and Charles P. Fox of the class of '90, and professor of Agriculture and director of station of the University of Idaho, attended the convention.

The convention passed a memorial upon the life and services of Dr. Townshend, whose death had just been announced.

The Columbus Horticultural Society.

The fiftieth anniversary of the Columbus Horticultural Society will be celebrated at Wells Post Hall, in the city of Columbus, on Thursday evening, September 5th. Addresses will be made by E. H. Cushmen, President of the Ohio State Horticultural

Society, N. Ohmer, President of the Montgomery County Horticultural Society, Prof. Lazenby of the State University, and others. All interested are cordially invited to be present.

This is the oldest active horticultural society in the State, and is one of the best known and most influential. It was organized in 1845. Its object is "the advancement of horticultural knowledge." It meets regularly on the last Saturday afternoon in each month, and during the past nine years the proceedings of these meetings have been published in the journal of the society, which is issued quarterly and mailed free to all members.

Cost of Keeping a Dairy.

The following is a summary of the receipts and expenditures of the University dairy for the year ending Dec. 31, 1894:

Pounds of milk produced.....	160,554 00
Receipts for milk.....	\$3,842 75
Cost of food.....	\$983 76
Cost of Labor.....	1,595 44
Total expenditures.....	2,579 20
Net gain.....	\$1,333 55

There was an average of about twenty-six cows actually in milk in the dairy during the year. As cows are bought and sold, not the same twenty-six cows were in the herd throughout the year. There are generally also, three or four dry cows in the herd.

From the summary it will be seen that for the number of cows actually in milk, 6,175 lbs. of milk were given per cow. The cost of food per cow was \$37.83, and the cost for labor was \$61.36, making a total expense per cow in milk, nearly \$100.00. The labor, however, included a considerable amount of experimental work and also the labor of taking care of dry cows, heifers, calves and bulls. The cost for food only relates to the cows in milk.

Assuming 8.6 lbs. per gallon of milk, the cost of food per gallon of

milk is 5.2 cts., the cost for labor per gallon of milk 8.5 cts., while the average price received for milk on this basis was 20.5 cts. It will be seen that the average cost of a gallon of milk retailed to consumers was 13.7 cts. The real cost, however, is somewhat greater than this, because more than 8.6 lbs. are required for a gallon of milk when peddled to the consumers.

It is worthy of notice that the work was all done by students, for which, it will be seen, they received \$1,595.44. The gross income from each cow actually in milk was \$147.80, the expense \$99.19, leaving a net income per cow of \$48.61, or for herd of twenty-six cows, a net gain of \$1,333.55.

It will be seen that the dairy not only pays its way, but also helps students on their way. We wish the barn might be enlarged so that it could accommodate about sixty head of milch cows. To do this, it has been estimated that it would require about \$3,000.00. Just a nice sum for some wealthy farmer to give. To what better purpose could he apply such a sum of money?

Football.

This season promises to excel anything before in the way of Athletics. Manager Dunlap is using every endeavor to have a football team that will surpass any heretofore. A date has been made to play a game with Purdue University, and the manager is in correspondence with several of the larger and noted colleges of the country. There is possibility for games with Ann Arbor, Cornell, Danville, Washington and Jefferson, and one or two others.

The largest class ever graduated from an American college was at the University of Michigan last year, which contained 731 members.

Native Plums in the University Orchards.

In many sections of the State, where the climate is too severe to grow the European plums with success, there is a steadily growing interest in our native species.

Ever since the introduction of the variety commonly known as the Wild Goose, our native plums have been receiving more or less attention at the hands of cultivators of fruit.

Quite a number of distinct forms of these native species are now in full bearing on the University grounds, and a few notes regarding some of the more valuable varieties may be of interest.

WILD GOOSE.—This is the oldest cultivated variety of native plum. There is a tradition that about the year 1850, a man shot a wild goose near Columbia, Tenn., and on the spot where the carcass was thrown this plum came up, the supposition being that the pit was in the crop of the goose. Soon after, when the good qualities of this variety became evident, it was introduced into general cultivation by the late J. S. Downer, of Fairview, Ky. This plum has a remarkably wide range of adaptability and is successfully grown from Southern Michigan to Texas. The edible quality of the Wild Goose is poor, but on account of its hardiness, beauty, earliness, productiveness and good shipping qualities, it is the most popular of our native plums.

GOLDEN BEAUTY.—This is one of the most productive varieties on our grounds. It is of fairly good size, with a clear yellow skin, flesh firm and of good quality. It ripens too

late to command the best price, yet, all things considered, ranks among the very best.

It is a wild variety from Southern Texas and was first introduced about twenty years ago.

THE NEWMAN.—This variety belongs to a different group, and, although less hardy than those just mentioned, produced an enormous crop the past season.

The fruit is rather large, nearly globular, and of a pinkish-red color.

It is a native of Kentucky.

Like the Wild Goose, this variety varies considerably in form of foliage, and in time of blooming and maturity of fruit.

LOUISA.—There are few native plums of finer quality than this. It is of good size, round, with a deep red skin, and firm melting flesh. Its season is medium. This plum was found growing wild in Missouri, and was first introduced by Samuel Miller. It is somewhat similar to the Weaver, but as grown on our grounds is a more desirable variety.

WILLIAM R. LAZENBY.

Prof. F. W. Rane, '91, who made a specialty of horticulture, has resigned the position of Horticulturist to the Experiment Station of West Virginia, which he has successfully filled for the past three years, to accept the position of Professor of Horticulture in the New Hampshire Agricultural College. Prof. Rane goes to his new field of labor with the best wishes of his numerous friends at the Ohio State University.

NOTICE TO STUDENTS.

WE wish to sell you Shoes, Rubbers and Slippers this year, and desire to do business with you on strictly business principles. We do not propose to mark our goods 50 per cent. profit and offer 10 per cent. discount to secure your trade, but will mark our goods 15 to 20 per cent. profit and sell to everybody alike, and guarantee our prices lowest in the city. Compare them and you will see we can save you money. 173 N. HIGH STREET.

STARKEY'S SHOE HOUSE.

Mr. E. E. Bogue, '94, well known for his enthusiastic interest in natural science and arboriculture, is now a member of the working staff of the State Experiment Station at Wooster. For the past two months he has been assisting the Entomologist, Prof. F. M. Webster. A considerable portion of his time has been spent in fighting the chinch bug, which has appeared in such quantities in various sections of Ohio during the present season.

The muscardine fungus infection has been sent to more than 600 different applicants, the requests coming from almost every part of the State.

F. B. Mumford, late assistant professor of Agriculture at Michigan Agricultural College, visited the University recently, and was the guest of Professor Hunt. He is on his way to accept the position of professor of Agriculture at the University of Missouri, and is taking the opportunity to visit several State Universities. Prof. Mumford has had considerable experience as an instructor, and the STUDENT predicts that Prof. Waters and he will rapidly bring Agriculture to the front in the University of Missouri.

The Hand Book and Directory.

Both these books are published under the authority of the Y. M. C. A. and King's Daughters. Endeavors are being made by those having the matter in charge to put forth a bound book and directory that will surpass anything heretofore put out. The matter in each is being carefully revised and prepared. The Hand Book is presented to each student, but 10 cents will be charged for the Directory. Both of these books are indispensable to the student. Don't fail to get one of each.

Rye Silage.

The fine quality and pleasant flavor of milk produced from green rye, also the fact of its being so early has made rye one of our foremost soiling crops. The great objection is that it does not last long enough. It cannot be depended upon for much more than a week. Of course this time may be lengthened by sowing plats at different times.

On the University farm in the fall of 1894, a large piece of corn ground was sown to rye. During the next spring while the rye was yet tender, a part of this was used for soiling the milch cows. The remainder of the piece was cut with a mowing machine, run through a tornado silage cutter and put into a silo.

The latter part of June, over five tons were taken off the top of the pit and thrown away. We began to feed the silage from the pit, at first putting it in the feed boxes in the barn. It did not take long to see that this would not do, as the cows left so large a per cent. uneaten. We hauled the remainder to the pasture or the paddocks, throwing it on the ground where the cows could eat it. The cows ate it fairly well under these circumstances, but hardly with the same result as corn silage. When changed to green corn, August 1st, there was a noticeable increase in milk. The youngest rye made the best silage. Some was left in the field until it became too dry, which partly accounts for the large amount that was taken from the top of the pit before reaching the good silage. The great objection which we have to rye silage is the peculiar odor.

The offensive odor of the silage, however, did not seem to be imparted to the milk.

Governor Morton, of New York, tried rye silage for feeding milch cows one season, with about the same results.

Y. M. C. A.

The Young Men's Christian Association is highly elated over the prospects of the coming year. Eight men were sent to the summer schools at Geneva, Knoxville and Northfield. They have come back to the University filled with earnestness and enthusiasm, and intend to impart to the fellows who could not avail themselves of the opportunity of attending some of the rich blessings received there.

The meetings are held weekly and will always be of interest to those who attend. The aim of the Association this year is "the University for Christ," and every student, both old and new, is requested to co-operate with the Association in attaining this high end.

Mr. J. S. Hine, '93, who has held the position of foreman of the gardens for the past year, has been transferred to the Department of Zoology and Entomology, in the capacity of assistant in Entomology. He has been in attendance at the summer school at Cornell University in preparation of his work. Mr. Hine is already a specialist in this field of work and his employment will be a great addition to the department.

Mr. Sherman Hood, '94, a graduate in the course in Horticulture, is now successfully practicing his profession on a place of his own in Trumbull county. He writes Prof. Lazenby that he is prospering in spite of the hard times; his crops are excellent and the market demand for good horticultural products are all that can be desired.

The Oklahoma Legislature has passed a law to prohibit the manufacture or giving away of cigarettes.

—S—

Teacher—"Why was George Washington a great man?"

Tommy—"Because we don't have no school on his birthday."

Happy Mother—Shall I give the baby a dollar to help the cutting of his teeth?

Happy Father—No, love, I wouldn't. It might give him wrong ideas on the silver question.

A young ladies' literary society of the University of South Dakota recently discussed, with closed doors, the following question: "Resolved, that higher education unfits a man for matrimony." The judges were wives of the faculty members and decided unanimously in the affirmative.—De Pauw Weekly.

Professor Lazenby recently made an extended trip through the West and Southwest. At present he is attending the meeting of the National Horticultural Society at Springfield, Mass.

G. W. Rightmire, and A. E. Addison, class '95, were two of the favored ones by the Columbus Board of Education.

J. W. Tell Duvel has spent most of the vacation at Wooster, assisting Professor Selby in botanical work.

Professor Hunt spent a part of his vacation in the West, attending the meeting of the Association of Agricultural Colleges and Experiment Stations and afterward visiting the scenes of his boyhood days. He returns after having spent a pleasant and enjoyable trip.

Prof. W. D. Gibbs returns Sept. 2 from Washington, D. C., where he has been employed in the Department of Agriculture, Division of Agricultural Soils. The position of assistant chief was tendered him, but owing to previous engagements at O. S. U. he refused.

China has no telegraph poles.



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Published monthly by

The Agricultural Student Publishing Co.

TERMS.

One Year,	\$.50
One-Half Year,30
Single Copies,05

While this paper is published with the consent and approval of the President of the University, and the officers of the School of Agriculture, the editors of this paper are alone responsible for the statements in all unsigned articles.

Address all communications to the Editor and Manager, Agricultural Student, Columbus, Ohio.

Entered at the Postoffice, Columbus, O., as second class matter.

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It speaks well for the School of Agriculture that three graduate students are taking advanced work in the school the present year, and that one graduate in the course in science is now pursuing undergraduate work in agriculture and horticulture.

THE AGRICULTURAL STUDENT heartily commends the practical methods pursued by Professors Hunt and Lazenby in the instruction of their different classes. Agriculture and Horticulture at the Ohio State University are not, as is often supposed, mere theoretical investigations and discussions, but are becoming every day more and more practical. Lectures are delivered with the subject in hand, and statements are proved as they are made. For instance: If in Agriculture the topic for discussion is the exterior of the horse,

the class does not meet in the class-room and sleepily listen to a long lecture and list of comparisons of the horse's conformation, but they adjourn to the stable where by the aid of standards and various appliances the measurements are carefully made and noted. For this purpose Professor Hunt has prepared a score card which is complete in every detail. The classes visit the local fairs and cattle sales, which are often held in the city, and much practical benefit is derived from these excursions.

In horticulture Professor Lazenby is active in securing new varieties of fruits and vegetables for class use. Visits are made to the markets and also to the orchards in this locality. The University garden is in constant use in furnishing examples for criticism and judgment by the class.

It is hoped that these statements will add in dispelling the seemingly popular idea that Agriculture and Horticulture at the Ohio State University are only taught theoretically. The courses offered here are not mere statements of theories but the persual of all the most prominent theories and the practical demonstration of the usefulness and especially the profit to be derived from the same.

THE large number of students in the four-year course in Agriculture is very encouraging to all those interested in this line of work. No Agricultural College in America has so large a number of Agricultural students in the long course as has the Ohio State University. The number of short-course students is large also, but not as large as it should be, con-

sidering the fact that there are 176 scholarships offered to students who take this course. It will not be long, we predict, until every scholarship will be taken and every county will have many able and bright students in the course. The farmers of Ohio are being aroused and when the final awakening comes they will see to it, that their sons and daughters will be instructed in the work which they are to follow. What better time for many of the boys to attend college than the coming winter term, when little can be done on the farm, and hence their absence from home less felt? And a good time to enter, too. Get a scholarship, and try it, boys.

WE wonder where the Indicator is this year; can any one tell us? Glowing were the tales of its prosperity last spring, but not a single word is heard of it now. Surely, with a circulation of a thousand copies and an advertising backing that could not be accommodated, one could not say that financial reasons have been cause of its non-appearance. And it makes a rather sad state of affairs, too; the reading public will suffer by its demise. We will have no longer any "up to date news" or "scoops," or "mammoth editions," like the Indicator furnished last year, (or at least as it said it furnished). Too bad, indeed, but we will have to be satisfied with what we have. Whether the Indicator is to rise again in the spring-time, we know not, but amid all the hopes, comes the thought—hopes once blasted will be blasted forever. Let us bow our heads; we stand at the grave of the Indicator.

The Board of Control of The Agricultural Student Union is considering methods and plans for experimentation. The Trustees of the University kindly gave the Union a small appropriation for

the carrying on of the work; and it is hoped everything will be in complete readiness by next spring, so that those desiring to carry on those experiments can do so under a uniform plan and order.

The following summary shows the number of students registered in the School of Agriculture for the present term:

Post Graduate	3
Seniors	7
Juniors	3
Sophomores	11
Freshmen	16
Second year, (Short Course)	9
First year, (Short Course)	19
Total	68

This is the largest number of advanced students that the School of Agriculture has had, but the number of new students is not as large as last year. It is not yet too late for good students to enter the University by making up the work already gone over by the classes and there are still several counties in which the free scholarship has not been taken.

THE twenty-fifth annual report of the Ohio State University was presented to the Governor, Oct. 1. It showed the receipts for the year ending June 30, 1895, to have been in round numbers \$167,000.00 and the disbursements to have been \$163,000.00. The report makes special mention of the gift of the McMillin Observatory by Emerson McMillin, and also of the devise in the will of Henry F. Page, the donation of the late Mrs. Henry C. Noble of her husband's law library, and the many smaller but not less acceptable gifts of equipment, machinery and additions to the collection. In addition to their direct value, these indicate an increasing interest in the University.

The school of law and the school

of ceramics received special mention and the following statement was made in regard to the dairy school: "The dairy school was opened at the beginning of the fall term 1894-5 in the basement of the chemical laboratory building. The cost of its equipment and support for the year was \$2,747.34. Forty-three students received instruction in the school. While the results so far have been satisfactory, both teachers and students have been more or less at a disadvantage because of the limited space in the laboratory and its crowded condition. To carry on the work properly will require much more room than can be afforded in any of the present buildings and a much larger equipment. It is hoped that the legislature will provide a building suitable for all the needs of the school at the earliest practicable opportunity."

Among the special needs of the University are mentioned some large cisterns to store an adequate supply of water for use in case of fire, a separate building for the department of agriculture, an armory and gymnasium with large hall for public assemblies. They recommend that appropriations be made for these buildings, for fire cisterns, and for the completion of the boiler house and consolidation of the steam heating plant.

It may be here stated that it has been proposed that in case an appropriation is made for a building for the department of agriculture, the building be known as Townshend Hall. Such a building would be a fitting memorial to the late Dr. Townshend, whose lifelong work in the cause of Agriculture has done so much for the University, the State and the Nation.

Football.

The football season has opened with a very promising outlook. The first game was played Oct. 5, with the Buchtel team. The score was 14 to 6 in favor of the Varsity eleven.

The team is very strong this year and it is almost safe to predict that there will be no defeats.

Football is growing in favor more and more; already it is here to stay. The attendance and interest so far has been very gratifying. Let students and friends encourage the team by their presence at every game.

Pointers For Those Interested In Athletics.

Cultivate and develop a spirit of genuine high-minded sportsmanship. Make no boasts until something has been actually achieved.

Remember that true sportsmanship does not consist in winning every game.

The crucial test is a noble, manly struggle for victory, and not the victory itself.

Too much professionalism, too much of spectacular gladiatorial combats in large cities for gate money, too little of sportsmanship in conduct, are among the things that will sound the death knell of inter-collegiate athletics.

Let us infuse into every branch of athletics here in the Ohio State University a spirit of true sportsmanship. There was never a better opportunity, never a greater need. Football is not a game for weaklings but it is a game that can be played in a manly way.

Corn Harvesters.

The Deering Harvester Co., and the McCormick Harvester Co., each operated their corn harvester and binder on the University farm, Oct. 2. This was in no case a competitive test. They were merely operated that those who were interested might see the efficiency and practicality of the machines. A heavy frost had already ripened the corn and the day being extremely dry, conditions were not favorable for the trial of such

machines. Naturally many of the leaves fell off as they would do upon the slightest touch and some ears were knocked off. In the condition of the corn, however, it was surprising to note how few ears were knocked off by either machine.

The corn was quite large, averaging perhaps upwards of nine feet high, was well eared and somewhat down, although it was standing as well as could ordinarily be expected at this date. Both machines took up down corn successfully even when purposely broken in the opposite direction from which the machine was going. Under such conditions, a stalk would be occasionally left by either machine but on the whole, the McCormick was the most successful in taking up down corn. The McCormick binds the stalks in a standing position while the Deering binds them while in a horizontal position. The result is that the butts are more even with the McCormick binder.

As operated, the McCormick bound bundles about one-half larger than the Deering. Both apparently could bind equally tight. The McCormick machine cut the corn off more squarely and left a cleaner, better looking row of stubs. A single dynamometer test was made of each machine under as nearly like conditions as possible. The draft of the McCormick was about 325 lbs. while that of the Deering was 225 lbs.

A large number of students and others witnessed the operation of the machines and were convinced that the corn harvester has come to stay. It should be noted, however, that these machines cut only one row at a time, and hence do not decrease the expense of harvesting corn in the same proportion that the self-binder reduces the expense of harvesting small grains.

Society may admire a fool, but it wishes him out of the way just the same.

Practical Horticulture in Our Country Schools.

Manual or industrial training is fast becoming a popular adjunct to our city schools and is helping to solve the problem of what to do with the city boy.

If something similar was introduced into our common schools would it not be equally helpful in solving the problem of what to do with the boy and girl in the country? The country schools of Ohio are being graded and in many rural townships high schools have been established. Are there any good reasons why manual training in horticulture should not be a feature of these schools? The required land for such purpose could be easily secured and the necessary tools and appliances would be comparatively inexpensive. The cultivation of flowers, ornamental shrubs and trees, a miniature model kitchen or vegetable garden, small plantations of fruit, could be easily undertaken. The operations of propagating plants by seeds, cuttings, grafting, budding, etc., transplanting, irrigating, fertilizing, pruning, might constitute some of the practical exercises at different seasons of the year. If we add to this a study of the most injurious weed by collecting and planting the same; the testing of some of the more simple remedies for insects and fungi; a thorough practical acquaintance with our native trees and shrubs, it could scarcely fail to arouse interest and develop a taste for scientific thought and investigation. Besides the direct practical value of such training it would cultivate the children's æsthetic faculties and develop an appreciation of the beautiful in nature and in art. Furthermore, it would mean an improvement of our school house grounds, and the proper adornment of these would tend to sweeten and purify the lives of the whole community. If we have good school buildings with beautiful sur-

roundings the inference is irresistible that we shall have well trained, noble teachers.

Should not the subject of practical horticulture in our country schools be thoroughly agitated and brought before the attention of every rural community? It appeals to every practical man. In its division and by its methods it furnishes technical training, useful knowledge, and intellectual culture.

If you say there is no time for such training then time should be made for it. There are few schools where certain unimportant subjects could not well be omitted or postponed in favor of this.

To train the eye and hand, to stimulate the power observation, to awaken an appreciation of the beautiful, in short to develop all the faculties of body and mind, is the aim of modern education. What better than manual training in horticulture can aid in securing this end.

W. R. L.

Problem in Soil Investigation.

The greater part of the work in soil investigation has been conducted along the line of chemistry. It was held by many reading scientists that, if the composition of plants were known it would be possible to determine, by chemical analysis of a soil, its relation to crop growth. This theory is not now generally held to be correct. Many soils which contain an abundance of all the mineral constituents found in plants are frequently barren wastes of land, although rainfall is sufficient and climate favorable for luxuriant crop growth. Chemical analysis of soil is considered of value as indicating the degree of fertility, but by no means does it determine the power of the soil to produce crops.

The feeling of dissatisfaction which existed, regarding the practical value

of chemical analysis of soils, led investigators to study the problems from a physical point of view, and their results, thus far obtained, have thrown much light on the general subject of soils and crop production. The Division of Agricultural Soils of the United States Department of Agriculture was established recently for the purpose of leading in this particular line of investigation. Several experiment stations are now taking up the work. Prof. Kings investigations at the Wisconsin station are considered especially valuable.

The problems that yet remain to be solved are innumerable. Some of the more general lines of work may be mentioned as follows: First, probably, in importance, is the question of the relation of soils to water. When we consider that from three hundred to five hundred pounds of water are required to produce one pound of dry matter of crop, and that practically all of this water comes from the soil, we see at once the importance of being able to control the supply of water in the soil by every means within our power.

Studies should be made of the texture and structure of soils with regard to their water holding capacities. Methods of cultivation should be compared for the purpose of determining which is most effective in preventing evaporation of moisture. These tests should be continued throughout the year. It is the ordinary practice to cultivate a field only enough to "make" the crop, after which time it is often allowed to go without cultivation or attention of any kind until the following spring when preparation is made for seeding. We have reason to suspect that, in many cases, if fields could be properly cultivated at times when crops are not growing, sufficient moisture would be retained in the soil to make the difference between a poor and a good yield in the following crop.

The question of conserving soil moisture is especially important where irrigation is practiced.

The action of fertilizers on soils is not well understood and should be studied further. Chemists, as a rule, contend that the beneficial results following their application are due to the amount of plant food furnished by the fertilizer, while physicists hold that fertilizers, as they are ordinarily applied, do not materially add to the supply of plant food in the soil, but, exert their influence by changing the physical structure of the soil, making it more retentive of moisture, and in other ways adapting it to crop growth.

Much work also needs to be done in classifying soils with regard to their origin, formation, and distribution. An improved system is also needed for describing soils. The terms "clayey," "sandy," "loam," etc., as now used, have but little scientific value.

Soil maps giving location and description of soil areas, together with climatic conditions, might well be published for the benefit of farmers.

The processes of soil nitrification, although very important to the farmer, are not well understood. The effect of growing different crops, and also the influence of the kind and amount of cultivation should be studied with reference to the formation of nitrates in the soil.

Many other lines of investigation might be mentioned, but perhaps these are sufficient to suggest the extent and importance of the work.

A Grass Garden.

A grass garden has been laid out in the field north of the Main Building for the purpose of class instruction. Professor Gibbs has collected all the different kinds of seeds obtainable. Besides being unique and novel, it will be very valuable for his class work in the spring.

AQUATIC LIFE.

A Laboratory To Be Established At Sandusky, Under the Direction of Professor Kellicott of the Department of Zoology.

For some time the question of establishing a laboratory for the study of aquatic life has been under discussion; and at last has materialized in a tangible form. The work will be under the charge of Professor Kellicott, assisted by a corps of professors and students from the University. It is expected the building will be completed by the end of the present college year.

The location has been happily chosen, after due consideration of its many advantages, in the city of Sandusky and on the easternmost bay, which will give easy access to the fishing grounds and to quiet waters teeming with living forms; the famous Islands, too, and the deeper waters of the Lake are easily reached. At no single place, perhaps, on the Great Lakes are there so many problems of deep interest to the biologists and to others engaged in important industries of the State.

Briefly, What are the plans for work and what are some of the problems that will be undertaken in the near future? To these questions it may be answered that it is not proposed to make a school of the laboratory, but a convenient place for research; still, it will afford an excellent opportunity for a student to obtain help and direction in the practical study of nature. Very naturally the location, at the place of the largest fresh-water fish industry in the world, will incline our studies in the direction of fish—their culture, enemies, etc.; nevertheless, students and instructors are to be perfectly free to choose their own special line of

research. Apparatus, books, etc., will be supplied by temporary removal from the departments of the University. In regard to what the first summer's work shall be, it is impossible at present to state. Some of the studies determined upon are such as pertain to the "plancton." But what is the plancton? The word has so recently come into use in the English language that it does not occur in any but the most recent Dictionaries. In general it means all that pertains to the life of the water, quantity, distribution and nature—more especially the minute forms which we are beginning to appreciate as important factors in the life and growth of larger and more useful forms as they are regarded. It, therefore, is important to know where this secondary life is, what it is, what causes affect it injuriously or otherwise. These facts and others of this nature must be known before the fish-culturist, for example, can intelligently and economically place the fry where there is certainty of their obtaining suitable food. Again, work will be done on the food of fishes at different stages of growth, particularly for the first few months of life; the various enemies of fishes, young and adult, will be considered; one of the party proposes to study the Rotifera, their distribution at different depths, food, habits, etc., in short, their relation to the plancton. If these questions are not enough for a small party of enthusiasts, the life histories of the whole field of aquatic life is at hand, and all admit that very few of our species have been sufficiently studied. Again, much collecting needs to be done for the University museums.

A word as to the immediate advantages to the University of these concentrated studies: There must result a substantial increase in material for study in one or more of the depart-

ments, and sound equipment is essential to University work; there must result substantial additions to scientific knowledge and to increase knowledge is one of the purposes of a University; a deeper spirit of investigation will doubtless be fostered among all concerned; and the University may thus become useful to and aid in the development of a great industry.

Summer Grain Feed for Cows.

Report of a feeding experiment with milch cows to try to determine: Whether or not it will pay to increase the grain feed of our cows from two pounds per day and per cow to six pounds per day and per cow, when they are on pasture and are getting all the rye ensilage and clover hay they will eat. And (2) to try to get at which feed is the better to make this increase, mill feed or dry distillery slops.

The mill feed was made up of four parts of wheat bran, four parts wheat shorts, and two parts buckwheat bran and middlings. The dried distillery slops were said to be 80% corn, 10% rye, and 10% barley malt.

Before the experiment feeding began, each cow received two pounds of mill feed per day. For the experiment, there were eighteen cows chosen from our dairy herd. These were carefully selected and then were separated into three lots of six each so that the milk producing power of each lot would be the same.

During the two weeks beginning June 5—

Lot A gave 1493.2 lbs. of milk,
 Lot B gave 1458.1 lbs. of milk,
 Lot C gave 1510.9 lbs. of milk,
 which is an average per week for
 Lot A, 746.6 lbs. of milk,
 Lot B, 729.0 lbs. of milk,
 Lot C, 755.4 lbs. of milk.

During the four weeks beginning June 19, lot A's grain feed was the same as during the two weeks previ-

ous, that is, two pounds of mill feed per day and per cow. Lot B's grain feed was increased to six pounds per day by the addition of four pounds of millfeed. Lot C's was increased to six pounds per day and per cow by the addition of four pounds of dried distillery slops. During these four weeks, lot A averaged 607.5 lbs. per week, lot B, 589.9 and lot C, 690.75 lbs.

By a closer examination we will see that the flow of milk for each lot was less per week during the last four weeks than it was during the two weeks of preliminary feeding. By a still closer examination it may be noticed that the lot which received an increase of four pounds (viz: 139 each week) as the lot that did not get an increase of grain feed, while the lot which received the increase of four pounds of dried distillery slops did not drop nearly so much, viz: 54.7 lbs. By carrying this a little further we will find that the lot receiving the distillery slops received per week 168 lbs. more grain feed than did lot A, and has for its credit a holding up power of 84.4 lbs. of milk per week as compared with the lot which did not get an increase of feed.

The distillery slops were valued at \$17.00 per ton. A gallon of milk weighs about 8.6 lbs. From the September STUDENT we find the last year we received an average of 20.5 cents per gallon for milk produced. With these figures as a basis, we find that the lot of cows that received 168 lbs. of distillery slops per week has to its credit 9.8 gallons of milk worth 20.5 cents or has \$2.00 worth of milk to put against the \$1.43 worth of distillery slops. If we were getting common creamery prices for our milk, there would not be as much and, perhaps, not any money made by making this increase of feed.

By way of remark it may be said: that the experiment goes to show

that if we are going to make an increase of grain feed for our cows, we should be careful to keep the proper proportion between the nitrogenous and carbonaceous foods. In this case it seems that the increase of mill feed did not help any in making the ration a balanced ration. The result was that we did not get any returns in milk for the extra feed. On the other hand, perhaps a less increase of distillery slops would have made just as great an increase as did the four pounds.

The Columbus Horticultural Society.

At the last regular meeting of this society Prof. Kellicott presented an interesting report on the chinch bug and hessian fly, and Secretary Hine read a carefully prepared paper on the corn-root worm. Prof. Lazenby read a paper on "some lessons from the horticultural exhibit at the State Fair." The exhibit of fruit was probably the best ever made in Ohio, the accommodations were ample, and the horticulturists of the state are to be congratulated, not only upon the display, but also upon the opportunities for arranging the exhibit in a satisfactory manner. A few improvements were suggested. For example, more care and system should be exercised in the matter of labeling. The names of each variety should be plainly printed on neat cards, and so attached as to be read without difficulty by all visitors. By the present method only a few could see the labels, for they were often upon scraps of note paper of any size and color, poorly written and carelessly placed between or under the fruit. Plain, careful, accurate labeling will do more than anything else in an educational point of view to make our fruit exhibits what we should like to see them. The October meeting of the society will probably be held in Westerville.

The Germs of Tuberculosis in Milk.

The question of tuberculosis in cattle has been occupying the attention of the people to an unusual degree. The question derives its importance, not alone from the money loss to the cattle industry, which is considerable, but largely from the danger which communicates from cattle to man. The disease has been found to be practically the same in man and animals. It is said that one-seventh of the deaths in the human race are due to tuberculosis; it will be readily understood that any knowledge which will enable us to deal more intelligently with this terrible disease is of the highest value.

The flesh and milk of cattle furnishes a large proportion of our cattle supply. If flesh and milk from cattle affected with tuberculosis is used, it is believed with good reason that there is danger of acquiring the disease. The danger lies in the fact that these substances may contain the tubercle bacillus, which is the microbe or germ which produces the disease. How great the danger is it is impossible to state definitely with our present knowledge. The danger from meat is probably not so great as from milk, as the former is, in cooking, usually subjected to a sufficient degree of heat to kill the germs, while the latter is used in its natural condition. When the udder of the cow is affected with the disease, it is highly probable that the milk will at some time contain tubercle bacilli, and, therefore, be unquestionably dangerous to use as food. The results in the past lead us to believe that bacilli occur in the milk of tuberculous cows, even when

the udder is not affected, and therefore that all milk from such a source is to be looked on with suspicion. There are two methods of ascertaining whether the disease germs are contained in milk; one is by direct microscopic examination of the milk, and the other is by feeding or inoculating healthy animals with it. In making use of the first method, the milk is collected in such a way as to exclude as far as possible germs from the outside; it is then spread on thin slips of glass, dried and stained with one of the aniline dyes to render the germs more readily visible. It is then examined with a high power of the microscope. But owing to small number of germs capable to milk it is proverbially like searching for a "needle in a haystack."

Greater reliance is therefore placed on the second method, viz.: feeding or inoculating animals with the milk. The chief resource is to inoculate guinea pigs or rabbits with the milk in such a way that the germs, if present, will find the most favorable conditions for development; these animals being especially susceptible to tuberculosis, the presence or absence of the germ is determined after a certain length of time by a careful post-mortem examination of the animal.

Clover As A Summer Pasture For Hogs.

Clover is a much better pasture for hogs in summer than is believed by farmers in many parts of Ohio. Too many farmers in the corn growing section of Ohio and adjoining States depend on corn for the summer ration for their hogs. They

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STARKEY'S SHOE HOUSE.

should have some corn, but there ought to be added other more nitrogenous and green substances with the corn. This ration can be got from clover with scarcely any outlay of work or expense, and at the same time it would be improving the soil for some grain crop. Some farmers that have clover pastures have their hogs, (and especially their brood sows) in some dry lot that has neither grass or clover. Clover is much superior to the grasses for hog pasture because they eat it much better. When clover is in blossom they will eat blossom and stem to the ground if necessary. They do not eat grasses readily after they become stemmy. By feeding a small amount of corn brood sows will thrive on clover. I have known farmers that would keep their brood sows all summer on clover not give any corn until in August after they have pigs. The sows and pigs would go into winter in good condition. It seems to me that the best way to fatten hogs is to have them on a good clover pasture. It is the cheapest way to make pork. In the spring when the pigs are small and with the mothers it is a good plan to have a small clover lot near the pig house. The little pigs can run out and get the young clover. The mother can be let out often until the clover has start enough to turn on permanent.

Hogs as well as any other stock should not be allowed to run on the clover pasture during the winter. The hogs pull out the clover roots and eat them. There should be some good well-cured clover to feed them during winter, they will eat it with a relish. I think clover is an essential to profitable pig growing.

E. J. RIGGS, '95, will take a course in Business College the coming winter, after which he will take up Horticultural work and Fruit growing in Missouri.

Hatching and Raising Chickens.

Almost every farmer raises some chickens. Many are now thinking of getting an incubator to hatch what chickens they keep on their farm; also artificial brooders. I write this article relating to some of my experience with the incubator and brooder, also as to what I think the best method for the average farmer to employ in raising chickens.

We have used artificial methods of raising chicks for two seasons. We have compared experience of hatching and results of same. In one case we got as good results with the incubator as with the hens, but it was no better. In all other instances the hens have given the best results. I do not mean to say that there can not be as good results from incubators, but this is our experience. The incubator is expensive for the average farmer. It takes a larger outlay of capital to start with than most farmers can spare. It requires labor to make it and money to furnish eggs and heat. It is hard to govern an incubator unless one has a room made for that purpose, and that is very expensive. Experience is one of the necessary things to run an incubator with, and that is the most expensive part for the farmer who wishes to raise only a few each year. Most farmers become disgusted with the machines and put them aside before they have learned how to use them. Where one makes a specialty of chickens and raises nothing else, he puts his whole time to it, and then all these things are all right. For the average farmer I think the hen is much the surest, safest and easiest cared

for, and least expensive. A word to those that intend to get an incubator: Get one with a hot water tank that will hold several gallons of water. This insures against sudden changes, and is easier to keep uniform. Get one with some kind of a heat regulator. That is the surest way to handle an incubator.

If a farmer has some non-setting breed of chickens, he can keep a few other hens to hatch his chicks. In this way he will not be to any extra expense. In some places there are people that keep incubators and make a business of hatching chicks for any one that wishes to pay them and furnish the eggs. If a farmer is near to such a place, that is the cheapest and best way to get the young chicks. I know of a man that gets his chicks. I know of a man that gets his chicks hatched for two cents per head. That is cheaper than the average farmer can afford to get the hatchlings for.

We have used brooders here with good results. By using a variety of food we can get as good results brooders as with hens. They are safe from cats, hawks and all other enemies to the little chicks. We have never had any gaps with chicks in the brooder. There should be a small wire-covered lot with the brooder so the chicks can get out on the ground when a few days old.

Nearly every agricultural paper has some method of making a home-made brooder. This is a thing I believe writers should be more careful about. They should not recommend a brooder until it has been tried by themselves in all

kinds of weather, and see if it is what they first thought it to be. A brooder to be a success should have some hot water tank, so there will be something to hold heat and be more constant in temperature. There are some brooders that give fairly good results without water; but the most of those described in farm journals without any water do not give much satisfaction in early spring weather. I believe that it will be profitable for farmers in some cases to have brooders and take the chicks from the hens and put them in; they are then free from all enemies.

Agriculture and Industrial Arts.

In a recent article in the Nebraska State Journal concerning the Ohio State University President in Ohio, Dr. Canfields quoted as follows: "A grand chance to work for a grand University not so very far in the future. We will make it the Ann Arbor of the State and more, for we will carry instruction in Agriculture and Industrial Arts, without which no State University is really complete."

WILLIAM STOWE DEVOL, a graduate of the Agricultural School and at present Director of the Experiment Station, University of Arizona, has taken the preliminary step of calling the first farmers' convention or institute in that territory. The convention will be held at Tucson, Oct. 18 and 19. A good program has been laid out, and the prospect is excellent for a large and enthusiastic meeting.

Prof. Lazenby's class of seniors in arboriculture are now making a systematic study of the native trees and shrubs of Ohio. This course is preparatory to the courses in forestry and landscape gardening.

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